

The integration of Machine Learning (ML) and Artificial Intelligence (AI) into healthcare operations has revolutionized the ability to handle complex data and derive actionable insights. At Abarca, we have embarked on applying these technologies in specific use cases to enhance our current capabilities in our Pharmacy Benefit Management (PBM) operations, aiming to improve efficiency, accuracy, and scalability. This white paper outlines the methodologies, models, applications, and future directions of our Machine Learning initiatives.

Machine Learning at Abarca

Machine Learning is a subset of Al that uses algorithms to enable systems to learn from data and improve over time. At Abarca, we leverage ML to streamline our PBM operations, thereby delivering a superior experience to our clients through better insights and cost reductions. Our mission is to transform the prescription experience and drive a broader healthcare revolution.

Abarca's Machine Learning Process



Define the Problem/Establish a Goal

Meet with stakeholders to align company objectives with the potential of Machine Learning solutions to streamline operations.



Research Solutions

Collaborate with stakeholders to understand the problem and develop solutions for the challenge.



Data Sourcing

Identify data elements that correlate with the target, investigate correlations, create features, and build a data pipeline.



Model Exploration

Evaluate multiple models with attributes that align with the characteristics of the dataset and target. Select the model with the best performance based on the problem requirements and resource availability.



Validation

Validate models using training and test data, and aggregate data at different levels. Adjust and tune the model parameters as needed to increase performance.



Implementation

Deploy the trained model in the operational pipeline, develop reporting mechanisms, and establish a feedback loop to monitor performance continuously.

Standard Machine Learning Models

At Abarca, our data engineers leverage the following different models and techniques to deploy our current ML solutions and include;

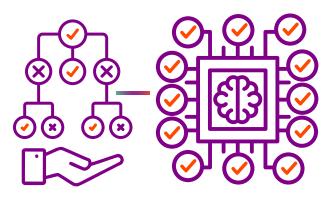
- Classification Models: Used to categorize data into distinct labels. Examples include Gaussian Naïve Bayes, Support Vector Machine (SVM), and K-Nearest Neighbors.
- ▶ **Regression Models:** Used to predict continuous numerical values. Examples include Ridge Regression and Lasso Regression.
- ▶ Ensemble Techniques: Combines predictions from multiple models to improve predictive performance. An example is Gradient Boosting, which uses weak predictors to improve model accuracy iteratively.

Applications of Machine Learning at Abarca

Fraud, Waste, and Abuse (FWA)

Problem Identification/Program Goal

The manual process of detecting FWA is time-consuming and prone to human error. With ML, we aim to improve the detection of potentially discrepant claims by reducing the time spent by the Pharmacy Integrity Team identifying claims to audit and facilitating the visualization of flagged claims.



Model Selection

After testing six models on the FWA dataset, Gradient Boosting and Random Forrest were selected for their accuracy and recall. The combined model maximizes true positives, improving the identification of suspicious claims.

Initial Results

Improved functionality for identifying suspicious claims.

25% improvement in efficiency by reducing time spent on manual selection and analyses.

Enhanced focus on targeted suspicious claims, leading to better identification and client savings.

RxTarget™ Adherence Program

Problem Identification/Program Goal

RxTarget[™] supports better health outcomes by increasing member drug therapy adherence by helping pharmacies through predictive modeling prioritize adherence drug refills and targeting members who require timely interventions to ensure patients remain adherent throughout the year. We explored the opportunity to enhance our current predictive modeling algorithm capability to improve the RxTarget™ ranking system to better identify intervention needs by pinpointing members likely to respond to interventions.



Accuracy: Improve the RxTarget ranking system to identify intervention needs.

Efficiency: Pinpoint candidates likely to respond to interventions. **Predictability:** Predict and proactively address potential non-adherence.

Scalability: Expand the module to more clients with improved results.

Plan Savings: Enhance adherence metrics for client savings and improved CMS Star Ratings.

Model Selection

For predicting adherence, we experimented with five methods, ultimately selecting Gradient Boosting for its balanced metrics in combination with low computational requirements.

Effectiveness of Model







Accuracy:

Precision:

Results

- Improved the effectiveness of the interventions by increasing the number of interventions that increased member adherence.
- During the first two years of implementation, there was a significant improvement in adherence rates, between 3%-5% per condition.
- ML ranking contributed to a 5.0 STAR rating for our flagship Medicare client, where greater than 50% of the members were dual eligible.

Future Directions



Drug Forecasting

ML will enhance our ability to identify utilization and cost trends, leading to better cost management and nuanced insights.

PA Automation

Efficiency in interpreting and implementing prior authorization criteria will improve the PA process, simplifying the compiling of necessary documentation.

Patient Safety

We aim to use ML to identify patterns leading to patient safety events, allowing prioritization of high-risk patients.

Conclusion

At Abarca, the integration of Machine Learning has significantly transformed our PBM operations. Although we are early in our journey to make healthcare more seamless and personalized by improving efficiency, accuracy, and scalability, we will be better equipped to deliver a better pharmacy benefit experience and exceptional service to our providers, clients, and patients. As we continue to innovate, we look forward to expanding these capabilities and driving further advancements in healthcare technology.

Want to Learn More?

To learn more about how Abarca's innovative solutions can benefit your organization, or if you have any questions about our Al solutions, please contact sales@abarcahealth.com.

